



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **LEUPOLD**

Serial No.: **10/644,566**

5 Filed: **August 19, 2003**

Docket No.: **CECOM-5472**

For: **STRUCTURES PRODUCING A MAGNETIC FIELD WITH A GRADIENT**

Sir:

10 These Remarks are submitted to support amending the above-identified application.

**REMARKS**

Claims 19-28, 44-48 and 53-56 are now in the case. Claims 1-18, 29-43 and 49-52 are drawn to non-elected claims and have been withdrawn. Claims 19-26 and 53-55 have been cancelled. No new claims have been added.

15 The first Office Action was a restriction requirement imposed by the Examiner based on four patentably distinct species and generic claims 44-48. Applicant elected claims 19-28 and 53-56 directed to the spherical species without traverse.

This Amendment responds to the second Office Action in this case. In this second Office Action, the Examiner objected to the Abstract for being lengthy and using patent law terminology, objected to claim 19 for an informality, rejected claims 20 and 21 under 35 USC § 112 for indefiniteness, rejected claims 19-26, 44-48 and 53-56 under 35 USC § 102(b) as being anticipated by Leupold U.S. Patent No. 5,216,401 and rejected claims 19-23, 44-46 and 53-55 under 35 USC § 102(b) as being anticipated by Masuyuki Japanese Patent No. 09-232135 A. The Examiner also objected to claims 21, 22, 45, 46, 54 and 55 for being in improper dependent form, stated that claims 27 and 28 were objectionable for being dependent on a rejected base claim and that they would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. This Amendment is submitted with separate sections for Introductory Comments, Amendments To The Claims, Amendments To The Specifications and these Remarks.

30 Each objection, rejection and response is set forth in more detail below. It is respectfully submitted that the specification and claims have been amended to overcome and obviate the

Examiner's objections and rejections.

The present Amendment revises the Abstract, revises dependent claims 27 and 56 into the independent format to make them allowable, cancels a number of objectionable claims, amends claim 28 to define variables in the recited formula and cancels other rejected claims to overcome and obviate the Examiner's 35 USC § 112 and 35 USC § 102(b) rejections. This Amendment also revises generic claim 44 by reciting some additional detail and modifies dependent claims 45-48 to recite the species identified by the Examiner in the restriction requirement. Based on these corrections and revisions, it is respectfully requested that the Examiner reconsider the objections and rejections. The Examiner also stated that objectionable dependent claims 27 and 28 would be allowable if rewritten in independent form. It is respectfully submitted that claim 27, as amended, has now been rewritten in independent form to overcome and obviate the Examiner's objection and that claim and 56 have also been revised and corrected in a similar manner. It is respectfully requested that the Examiner reconsider the objections and rejections and that the claims, as amended, be allowed and pass to issue.

Before responding to the prior art rejections, applicant's attorney will describe this Amendment's revisions to the Abstract and claims 27, 28, 44-48 and 56 and demonstrate that they are adequately supported by the specification and do not constitute prohibited new matter. The Abstract has been shortened considerably and no longer includes "patent law" terminology. Former dependent claim 27 has been converted to the independent format and now recites the subject matter of cancelled claims 19, 20 and 23-26 without including the objectionable words "are" from claim 19, line 2 and "abruptly" from claim 20. Also, the objectionable formulas of claims 21 and 22 have not been included in amended claim 27 to overcome the objection and 35 USC § 112 indefiniteness rejections of those claims. Claim 28, as amended, has now been corrected to define variable H as the magnetic field and variable  $B_r^{(t)}$  as the magnetic remanence of the magnetic material used to construct the structure, which are adequately supported by specification page 9, lines 12-14 for H and specification page 6, lines 1-4 for  $B_r^{(t)}$ , without adding any prohibited new matter.

Former dependent method claim 56 has been converted to independent form in a manner similar to amended claim 27 and now recites a method of generating a magnetic field gradient,

comprising the steps of forming a spherical magnetic field gradient source from a group of nested concentric magnetic laminae, generating a uniform volume magnetic charge density,  $\rho$ , for the layered magnetic sphere, causing a magnetic gradient with a linear dependence of magnetic field and positioning a tunnel through the working space. It is respectfully submitted that amended  
5 claim 56 now recites the subject matter of cancelled claim 53 without the objectionable formulae of claims 54 and 55. It is respectfully requested that claim 56, as amended, be allowed and pass to issue.

Consistent with the Examiner's earlier restriction requirement, generic claims 44-48 have been revised. Independent generic claim 44 now recites a method of generating a magnetic field  
10 gradient, comprising the steps of forming a magnetic field gradient source from magnetic laminae layered into a magnetic stack with top and bottom outer laminae surfaces and a stack center; dimensioning a stack thickness,  $t$ , to be less than the lamina longitudinal length,  $L$ ; providing each magnetic laminae with a variable magnetic strength,  $M(r)$ ; configuring the magnetic stack to cancel unpaired negative surface charges from the top and bottom outer lamina  
15 surfaces; allowing the variable magnetic strength,  $M(r)$ , to vary linearly with a normal distance,  $r$ , from the stack center; causing the perpendicular magnetic orientation and the variable magnetic strength,  $M(r)$ , to generate a uniform volume magnetic charge density,  $\rho$ , for the magnetic stack and a magnetic gradient with a linear dependence of magnetic field and positioning a tunnel through the source as a working space. Claim 44, as amended, no longer recites the planar  
20 species and is now drawn to all of this invention's magnetic field gradient sources. Dependent method claims 45-48 have been revised to delete the objectionable formulae of claims 45 and 46, in a manner similar to claims 27 and 56 and to recite the planar, cylindrical, spherical and planar-spherical species identified by the Examiner in the restriction requirement. Dependent claim 48 also recites that the magnetic laminae in the planar magnetic field gradient source are formed  
25 from disks. It is respectfully submitted that claim 44, as amended, is now drawn to all of this invention's magnetic field gradient sources and that dependent method claims 45-48 now recite each species of this invention. It is respectfully requested that the claims 44-48, as amended, be allowed and pass to issue.

The Examiner rejected claims 19-26, 44-48 and 53-56 as being anticipated under 35 USC

§ 102(b) by Leupold U.S. Patent No. 5,216,401 entitled "Magnetic Field Sources Having Non-Distorting Access Ports." According to the Examiner, the Leupold '401 patent discloses a spherical magnetic field gradient source structure, comprising nested concentric magnetic laminae arranged in a layered magnetic sphere and other elements of this invention including several depicted in FIG. 6 of that patent, a perpendicular magnetic orientation and a variable strength  $M(r)$ . The Examiner also stated that certain claimed limitations of the present invention would have been inherently present in the Leupold '401 magnetic structure and that other claimed limitations are also disclosed by FIG. 6.

These rejections of amended method claims 44-48 and 56 are hereby traversed.

It is respectfully submitted that the purpose, structure and operation of the present invention are substantially different and distinct from the Leupold '401 patent, and that claims 27, 28, 44-48 and 56, as amended, are not anticipated by that patent under 35 USC § 102(b).

It is respectfully submitted that the purposes of the present invention and the Leupold '401 FIG. 6 magnetic structure are completely different. The present invention discloses and claims the layered magnetic field sources depicted in FIG'S 3A and 3B providing a uniform volume magnetic charge density,  $\rho$ , and a magnetic gradient. This invention's purpose is briefly described at specification page 2, lines 3-13, as follows:

Thus, there has been a long-felt need for simple and inexpensive magnetic field gradient sources that produce a strong volume charge density using layered structures that can cancel unwanted surface charges.

The magnetic structures of the present invention overcome the shortcomings and limitations of minimizing unwanted negative charges with a layered, or laminated, arrangement of magnets configured so that the unwanted negative charges are mutually cancelled by other parts of the structure. The field gradient sources of the present invention comprise a series of stacked magnetic laminae that are magnetically oriented perpendicular to their planes... (Emphasis Supplied)

By contrast, COL. 2, lines 26-33 of the Leupold '401 patent describes its purpose as providing:

...a high-intensity, permanent-magnet flux source having access ports that do not

significantly effect the uniformity of a working magnetic field...the present invention contemplates a magnet having a shell of magnetic material with a hollow cavity and an access port that passes through the shell and communicates with the cavity.

(Emphasis Supplied)

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The Leupold '401 structure is a magnetic shell enclosing a hollow cavity with an access port to the hollow cavity to provide distortion-free access ports to constant unidirectional magnetic fields and is not concerned with field gradients, minimizing the deleterious effects of unwanted surface charges, or stacking magnetic layers. For these reasons, it is respectfully submitted that  
10 the purpose of the present invention is completely different from that of the Leupold '401 magnetic structures.

It is also respectfully submitted that the structure of the Leupold '401 FIG. 6 device is substantially different and patentably distinct from this invention's layered structure. According to the Examiner, the Leupold '401 patent, particularly FIG. 6, discloses many of this invention's  
15 elements, including a spherical magnetic field gradient source structure comprising nested concentric magnetic laminae arranged in a layered magnetic sphere, a perpendicular magnetic orientation and a variable strength  $M(r)$ . Leupold '401 COL. 5, lines 51-62 describes FIG. 6 as follows:

FIG. 6 shows a segmented "magic-sphere" type magnet 60 having narrow, cylindrical  
20 access ports 70 that are axially aligned on opposite sides of magnet 60...Magnet 60  
comprises a series of nested cones 61-69. Disregarding ports 70, polar cones 61, 69 are solid and the series of nested cones 62-68 have the appearance of conical shells with a spherical cavity 71 which houses a uniform working field (see arrow 72). Magnet 60, which is similar in shape to magnet 30 of FIG. 2, is made up of nine cones 61-69 which are each made up of  
25 eight segments for a total of seventy-two segments, eighteen of which are not shown.

(Emphasis Supplied)

This invention's spherical magnetic field gradient source is depicted in FIG'S 3A and 3B, and is briefly described as a layered nested magnetic spherical structure at specification page 8, lines 1-8, as follows:

FIG. 3A is partial cut-away frontal view of a spherical field gradient source 30  
comprising a layered magnetic sphere 31 having nested concentric magnetized laminae 32  
... The removed cutaway section reveals the concentric magnetized laminae 32 nested  
within one another. In this case, arrows 34 indicate that magnetization is perpendicular to  
5 the radial direction everywhere. As in the other embodiments, the magnetization of each  
magnetized laminae 32 varies linearly with distance from the center 33. FIG. 3B is an  
equatorial cross-sectional side view of the spherical field gradient source 30 depicting the  
magnetic sphere 31 composed of concentric magnetic laminae 32 and the center 33.

(Emphasis Supplied)

10 The Leupold '401 FIG. 6 segmented magnet 60 is composed of nested cones 61-69 that form a  
sphere, while this invention's layered magnetic sphere 31 is composed of a series of concentric  
magnetic laminae 32, or layers, "nested one with another." The inner cross-section of the  
Leupold '401 FIG. 6 structure resembles a sliced orange, while the FIG. 3B cross-sectional view  
of this invention looks like a sliced onion. Other structural differences include the Leupold '401  
15 FIG. 6 segmented magnet 60 having a hollow cavity 71, access ports 70 and a uniform working  
field 72, while this invention's layered magnetic sphere 31 has a solid center 33 and a  
perpendicular magnetization in the radial direction 34. Also, COL. 5, lines 63-65 in the Leupold  
'401 patent defines "MR" as "resultant magnetization," which is not "M(r)" representing "a  
variable strength" as in this invention. Thus, the Leupold '401 FIG. 6 device is not composed of  
20 nested concentric magnetic laminae arranged in a layered magnetic sphere with each nested  
concentric magnetic laminae being thinner than a spherical radius, a perpendicular magnetic  
orientation and a variable strength M(r). Therefore, it is respectfully submitted that this  
invention's spherical magnetic field gradient source is not anticipated by the Leupold '401 FIG. 6  
magnet due to substantial structural differences.

25 It is respectfully submitted that amended method claims 44-48 and 56 are not anticipated  
by the Leupold '401 FIG. 6 segmented magic sphere magnet 60 because Leupold '401 FIG. 6  
does not show all this invention's claimed features. Leupold '401 FIG. 6 is described at COL. 3,  
lines 7-10 as showing "...a pictorial view, with a ninety-degree section removed to reveal an  
inner cross section, of a magnet of a "magic-sphere" type..." Leupold '401 FIG. 6 is

substantially different from FIG'S 3A and 3B of the present invention because it lacks sufficient features and details to qualify as prior art anticipating the present invention under 35 USC § 102 (b) as required by MPEP § 2125 Drawings As Prior Art. MPEP § 2125 describes when a drawing can be used as prior art as follows:

5 Drawings and pictures can anticipate claims if they clearly show the structure which is claimed. In re Mraz, 455 F. 2d 1069, 173 USPQ 25 (CCPA 1972). However, the picture must show all the claimed structural features and how they are put together. Jockmus v. Leviton, 28 F.2d 812 (2d Cir. 1928)...When the reference is a utility patent, it does not matter that the feature is unintended or unexplained in the specification. The  
10 drawings must be evaluated for what they reasonably disclose and suggest to one of ordinary skill in the art. In re Aslanian, 590 F. 2d 911, 200 USPQ 500 (CCPA 1979)...

(Emphasis Supplied)

MPEP § 2125 requires that Leupold '401 FIG. 6 "clearly show[s] the structure which is claimed," including "all claimed structural features." Assuming arguendo that Leupold '401 FIG.  
15 6 depicts the elements cited in the Examiner's rejection, MPEP § 2125 Drawings As Prior Art requires that Leupold '401 FIG. 6 "clearly show[s] the structure which is claimed," including "all claimed structural features." However, Leupold '401 FIG. 6 does not depict the following elements of the generic claim 44 method of generating a magnetic field gradient:

forming magnetic laminae with a longitudinal length, L;

20 layering the magnetic laminae into a magnetic stack;

forming a stack center;

dimensioning a stack thickness, t, less than said longitudinal length, L;

providing the magnetic laminae with a magnetic charge distribution and a perpendicular magnetic orientation;

25 configuring said magnetic stack to cancel unpaired negative surface charges from the top outer lamina surface and the bottom outer lamina surface;

allowing said variable magnetic strength,  $M(r)$ , to vary linearly with a normal distance,  $r$ , from the stack center;

causing the perpendicular magnetic orientation and variable magnetic strength,  $M(r)$ , to

generate a uniform volume magnetic charge density,  $\rho$ , for the magnetic stack, a magnetic field,  $M$ , perpendicular to said magnetic stack, a maximum stack magnetization,  $M(t)$ , and a magnetic gradient with a linear dependence of magnetic field; and

forming the magnetic laminae from disks.

5 Further, Leupold '401 FIG. 6 neither discloses nor teaches the four species of generic claim 44 that are recited in dependent claims 45-48. Additionally, Leupold '401 FIG. 6 lacks many of the elements of amended method claim 56. Since Leupold '401 FIG. 6 does not depict a number of significant elements of the claimed invention, the Examiner's anticipation rejection under 35 USC § 102 (b) appears to be contrary to MPEP § 2125 Drawings As Prior Art by failing to  
10 "clearly show the structure which is claimed," including "all claimed structural features." It is respectfully submitted that this drawing lacks sufficient features and details to qualify as prior art anticipating the present invention under MPEP § 2125 Drawings As Prior Art.

It is also respectfully submitted that the operation of the Leupold '401 devices is substantially different and distinct from the present invention. COL. 4, lines 1-6 of the Leupold '401 patent  
15 explains that its segmented magnet seeks to minimize the field distortions to a working field caused by access ports. COL. 5, line 62-COL. 6, line 42 of the Leupold '401 patent describes the operation of the segmented magnet 60, as follows:

... In the present invention, however, the magnetization configurations of permanent magnets of the type described above are oriented so that distortions of the working fields due to the presence of access ports are significantly reduced.  
20

Generally, magnetization configurations in magnets made in accordance with the present invention are such that the intensity and polarization directions vary throughout the magnet. The magnetization intensity varies such that it is substantially zero in the regions adjacent the access ports...  
25

....  
Consequently, the combined effect of components M1 is to produce a uniform working field in cavity 71. Because components M2 are uniform, no magnetic field is produced in cavity 71 by these components. Also, since components M1 and M2 cancel in cones 61, 69, there is no remanence in these regions, which is the equivalent of having no magnetic

material in these regions. As such, removal of this material to provide access ports 70 has no effect on the magnetic field in cavity 71. Also for the same reason, the uniformity of the working field (arrow 72) produced by components M1 is unaffected by the addition of access ports 70. (Emphasis Supplied)

5 The operation of the Leupold '401 segmented magnet 60 is based on orienting the conical magnetic segments 61-69 in such a way that the magnetization intensity is effectively neutralized in regions adjacent to the access ports 70 so that removal of the magnetic material there will not affect the uniform magnet field in hollow cavity 71. By contrast, the operation of the present invention provides magnetic field gradient sources that produce a strong volume charge density,  $\rho$ , using layered structures that can cancel unwanted surface charges. Specification page 3, lines 10 4 -20 describes this invention's essential operation as follows:

These and other objects and advantages are accomplished with the present invention providing magnetic field structures comprising stacked magnetic laminae that are magnetically oriented perpendicular to their planes and configured so that a volume charge density is provided and the field effects of unwanted surface negative charges are cancelled. 15 These objects and advantages are accomplished by arranging stacked thin magnetic laminae into various configurations where each of the magnetic laminae is thinner than the radius of that particular layer and the magnetic strength,  $M(r)$ , of each layer will vary linearly with the normal distance ( $r$ ) from the stack's center ...Such an arrangement causes a uniform volume magnetic charge density,  $\rho$ , which results in a magnetic field normal to the laminae of the magnitude,  $M$ . One important advantage of this invention's stacked magnetic laminae magnetic field structures is to cancel the field effects of the deleterious unwanted surface charges because these surface charges are so situated that their contributions to the internal magnetic field mutually cancel each other, and thus they are no longer detrimental to the 20 magnetic field created by the volume charge density. (Emphasis Supplied) 25

In accordance with the present invention, the stacked magnetic layers are configured to provide a volume charge density,  $\rho$ , and to cancel the deleterious unwanted surface charges so that they are no longer detrimental to the magnetic field created by the volume charge density,  $\rho$ . This is quite different from the operation of the Leupold '401 segmented magnet 60 which is to arrange

conical magnetic segments in a way to neutralize regions of magnetization intensity adjacent to the access ports 70 so that uniform magnetic field in hollow cavity 71 will not be distorted by drilling the ports. The Leupold '401 structure is not composed of stacked magnetic layers, does not provide a volume charge density,  $\rho$ , and cannot cancel the deleterious unwanted surface charges like the present invention can. It is respectfully submitted that the operation of the present invention is substantially different and distinct from the Leupold '401 devices.

It is respectfully requested that the Examiner reconsider the 35 USC § 102(b) anticipation rejection of amended claims 44-48 and 56 based on the Leupold '401 patent because the purpose, structure and operation of the present invention are substantially different and distinct from that patent and not anticipated under 35 USC § 102(b).

The Examiner also rejected claims 19-23, 44-46 and 53-55 under 35 USC § 102(b) as being anticipated by Masuyuki Japanese Patent No. 09-232135 A entitled "Magnet For Motive Force," issued on September 5, 1997. According to the Examiner, the Masuyuki patent discloses a spherical magnetic field gradient source structure, comprising nested concentric magnetic laminae arranged in a layered magnetic sphere, and other elements of this invention including several depicted in FIG. 1 and the JPO Abstract, a perpendicular magnetic orientation and a variable strength  $M(r)$ . The Examiner also stated that certain claimed limitations of the present invention would have been inherently present in the Leupold '401 magnetic structure and that other claimed limitations are also disclosed by FIG. 6.

These rejections of amended method claims 44-46 and 56 are hereby traversed.

It is respectfully submitted that the purpose, structure and operation of the present invention are substantially different and distinct from the Masuyuki patent, and that claims 27, 28, 44-48 and 56, as amended, are not anticipated by that patent under 35 USC § 102(b).

It is respectfully submitted that the purposes of the present invention and Masuyuki's multilayered magnetic structure are completely different. The present invention discloses and claims the layered magnetic field sources depicted in FIG'S 3A and 3B providing a uniform volume magnetic charge density,  $\rho$ , and a magnetic gradient. The purpose is briefly described at specification page 2, lines 9-12 as "...minimizing unwanted negative charges with a layered, or laminated, arrangement of magnets configured so that the unwanted negative charges are

mutually cancelled by other parts of the structure. The field gradient sources of the present invention comprise a series of stacked magnetic laminae that are magnetically oriented perpendicular to their planes..." By contrast, the Masuyuki Abstract's Problem To Be Solved is stated as obtaining magnetic force using rotational force by suppressing diffusion of a magnetic field by "lamine-integrating" in a spherical shape. Masuyuki's structure provides an "intense" polar magnetic fields North and South by "reduction-concentrating" a rotation fault domain with a spherically shaped magnet comprising layers of individually magnetized plates and is not concerned with field gradients or minimizing the deleterious effects of unwanted surface charges. Instead the Masuyuki patent is concerned with obtaining a magnetic force by rotating a spherical magnet composed of layered magnetized plates. For these reasons, it is respectfully submitted that the purpose of the present invention is completely different from that of the Masuyuki magnetic structures.

It is also respectfully submitted that the structure of the Masuyuki FIG. 1 device is substantially different and patentably distinct from this invention's stacked magnetic laminae. According to the Examiner, the Masuyuki patent discloses many of this invention's elements, including a spherical magnetic field gradient source structure comprising nested concentric magnetic laminae arranged in a layered magnetic sphere, several elements depicted in FIG. 1, a magnetic charge distribution and a variable strength  $M(r)$ . The Masuyuki machine-translated Means For Solving the Problem discloses forming a "multilayer object magnet...hard solid sphere," with FIG. 1 depicting three planar layers forming a sphere. This invention's spherical magnetic field gradient source is depicted in FIG'S 3A and 3B, and are briefly described as concentric layered nested magnetic spherical structures providing a uniform volume magnetic charge density,  $\rho$ , and a magnetic gradient at specification page 8, lines 1-8, quoted above. The Masuyuki FIG. 1 multilayered magnet is composed of un-nested planar layers forming a sphere, while this invention's layered magnetic sphere 31 is composed of a series of concentric magnetic laminae 32, or layers, "nested one with another." The FIG. 3B cross-sectional view of this invention looks like a sliced onion, but Masuyuki FIG. 1 does not. Thus, the Masuyuki FIG. 1 device is not composed of nested concentric magnetic laminae arranged in a layered magnetic sphere with each nested concentric magnetic laminae being thinner than a spherical radius, a

perpendicular magnetic orientation and a variable strength  $M(r)$ . Therefore, it is respectfully submitted that this invention's spherical magnetic field gradient source is not anticipated under 35 USC § 102(b) by the Masuyuki FIG. 1 multilayered magnet due to substantial structural differences.

5 It is also respectfully submitted that amended method claims 44-48 and 56 are not anticipated by the Masuyuki FIG. 1 multilayered magnet because Masuyuki FIG. 1 does not show all this invention's claimed features. Masuyuki FIG. 1 is substantially different from FIG'S 3A and 3B of the present invention and lacks sufficient features and details to qualify as prior art anticipating the present invention under 35 USC § 102 (b) as required by MPEP § 2125

10 Drawings As Prior Art, quoted above. MPEP § 2125 describes when a drawing can be used as prior art and requires that Masuyuki FIG. 1 "clearly show[s] the structure which is claimed," including "all claimed structural features." Assuming arguendo that Masuyuki FIG. 1 depicts the elements cited in the Examiner's rejection, MPEP § 2125 requires that it "clearly show[s] the structure which is claimed," including "all claimed structural features." However, Masuyuki  
15 FIG. 1 does not depict the following elements of the generic claim 44 method of generating a magnetic field gradient:

forming magnetic laminae with a longitudinal length,  $L$ ;

layering the magnetic laminae into a magnetic stack, the magnetic stack having a top outer lamina surface, a bottom outer lamina surface and a stack center;

20 dimensioning a stack thickness,  $t$ , to be less than the longitudinal length,  $L$ ;

providing the magnetic laminae with a magnetic charge distribution, a perpendicular magnetic orientation and a variable magnetic strength,  $M(r)$ ;

configuring the magnetic stack to cancel unpaired negative surface charges from the top outer lamina surface and the bottom outer lamina surface;

25 forming a magnetic field gradient source;

allowing the variable magnetic strength,  $M(r)$ , to vary linearly with a normal distance,  $r$ , from the stack center;

causing the perpendicular magnetic orientation and the variable magnetic strength,  $M(r)$ , to generate a uniform volume magnetic charge density,  $\rho$ , for the magnetic stack, a magnetic

field,  $M$ , perpendicular to the magnetic stack, a maximum stack magnetization,  $M(t)$ , and a magnetic gradient with a linear dependence of magnetic field; and

forming the magnetic laminae from disks.

Further, Masuyuki FIG. 1 neither discloses nor teaches the four species of generic claim 44 that are recited in dependent claims 45-48. Additionally, Masuyuki FIG. 1 lacks many of the elements of amended method claim 56. Since Masuyuki FIG. 1 does not depict a number of significant elements of the claimed invention, the Examiner's anticipation rejection under 35 USC § 102 (b) appears to be contrary to MPEP § 2125 by failing to "clearly show the structure which is claimed," including "all claimed structural features." It is respectfully submitted that this drawing lacks sufficient features and details to qualify as prior art anticipating the present invention under MPEP § 2125.

It is also respectfully submitted that the operation of the Masuyuki devices, which seems to be based on rotational forces, is substantially different and distinct from the present invention. By contrast, the operation of the present invention provides magnetic field gradient sources that produce a strong volume charge density using layered structures that can cancel unwanted surface charges. Specification page 3, lines 4 -20 describes this invention's essential operation as providing magnetic field structures comprising stacked magnetic laminae that are magnetically oriented perpendicular to their planes and configured so that a volume charge density is provided and the field effects of unwanted surface negative charges are cancelled. The stacked magnetic layers of this invention are configured to provide a volume charge density,  $\rho$ , and to cancel the deleterious unwanted surface charges so that they are no longer detrimental to the magnetic field created by the volume charge density. This is quite different from the operation of the rotating Masuyuki multilayered magnet which seeks to suppress diffusion of the magnetic field with the planar layers. The Masuyuki structure is not composed of concentric stacked magnetic layers, does not provide a volume charge density,  $\rho$ , and cannot cancel the deleterious unwanted surface charges like the present invention can. It is respectfully submitted that the operation of the present invention is substantially different and distinct from the Masuyuki multilayered rotating magnets.

It is respectfully requested that the Examiner reconsider the 35 USC § 102(b) anticipation

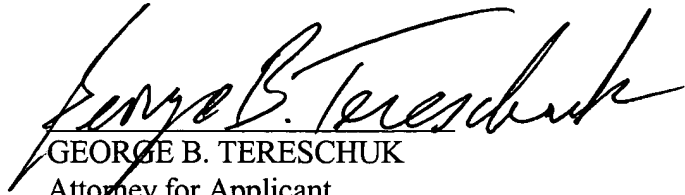
rejection of amended claims 44-46 and 56 based on the Masuyuki patent because the purpose, structure and operation of the present invention are substantially different and distinct from that patent and not anticipated under 35 USC § 102(b).

It is respectfully requested that the Examiner reconsider the 35 USC § 102(b) anticipation rejection of amended claims 44-48 and 56 based on the Leupold '401 patent because the purpose, structure and operation of the present invention are substantially different and distinct from that patent and not anticipated under 35 USC § 102(b).

In conclusion, it is respectfully submitted that the Abstract has now been revised to correct the formal matters raised by the Examiner, that the objections to claims 19, 27 and 28 and the rejections of claims 20 and 21 under 35 USC § 112 for indefiniteness have been overcome and obviated by canceling claims 19-26 and revising claim 27 into an independent claim to include the limitations of the base claim and any intervening claims, except for the objectionable formulae of claims 21-22. It is respectfully submitted that generic method claims 44-48 and method claim 56, as amended, have overcome and obviated the Examiner's 35 USC § 102(b) anticipation rejection based on the Leupold '401 patent because the purpose, structure and operation of the present invention are substantially different and distinct from that patent. It is also respectfully submitted that generic method claims 44-48 and method claim 56, as amended, have overcome and obviated the Examiner's 35 USC § 102(b) anticipation rejection of amended claims 44-46 and 56 based on the Masuyuki patent because the purpose, structure and operation of the present invention are substantially different and distinct from that patent. It is respectfully requested that the Examiner reconsider the objections and rejections and that claims 27-28, 44-48 and 56, as amended, be allowed and pass to issue.

Should the Examiner require further information, the Examiner is invited to telephone the applicants' attorney at the telephone number listed below.

Respectfully Submitted,



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DATE